

Exhibit D

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.,)	
)	
Plaintiff,)	
)	
v.)	Civ. A. No. 10-03561 WHA
)	
GOOGLE INC.,)	(Jury)
)	
Defendant.)	

**EXPERT REPORT OF PROFESSOR DOUGLAS C. SCHMIDT, Ph.D. REGARDING FAIR
USE AND REBUTTAL TO GOOGLE’S OPENING EXPERT REPORTS**

February 8, 2016

HIGHLY CONFIDENTIAL

Moreover, Android's implementation of the 37 API packages fails to pass the Java Compatibility Kit's Signature Test, and thus fails on a widely accepted benchmark against which to measure compatibility. Finally, Android uses only a subset of the Java SE platform's 166 API packages, which compromises its compatibility with Java SE.

205. In the entirety of his report, Dr. Astrachan makes no mention as to the notion of Android's compatibility with Java based on the standards outlined in my opening report. Instead, his definition of compatibility simply serves as a proxy for satisfying expectations of the community—for instance, he implies that the `java.net` package ensures basic functionality because "every modern mobile platform has networking functionality." (Astrachan, ¶171).

206. Astrachan even acknowledges how using a subset of software jeopardizes compatibility by stating that the LX Brand (Sun's way of allowing Linux programs to run on its Solaris operating system) "implements only a subset of the Linux operating system API, and so is not completely compatible with Linux." (Astrachan, ¶297) However, he fails to directly address the fact that Android provides only a subset of the Java SE APIs, even though his own line of reasoning would clearly show that Android is not compatible with Java for the very same reason.

207. For the reasons described above, I disagree with Dr. Astrachan's opinion regarding the use of method declarations from the 37 API packages to ensure compatibility. It is my opinion that Dr. Astrachan addresses the idea of compatibility very narrowly, and does not comment on important technical issues relating to compatibility, even though statements in his report clearly show that he is aware of the existence of such issues. Dr. Astrachan also seems to ignore the conclusion of the Federal Appeals Court that the Java and Android platforms are not compatible.¹⁵⁰

208. Google exerts control over other APIs that are very similar to the APIs at issue. For example, I understand that Google has a set of APIs called the "AdWords APIs," which are subject to restrictive licensing terms. I have reviewed the AdWords APIs and find them to be similar to the Java API declarations at issue, in that they consist of brief lines of declaring code

¹⁵⁰ "Although Android uses the Java programming language, it is undisputed that Android is not generally Java compatible.", United States Court of Appeals for the Federal Circuit, *Oracle America Inc. v. Google Inc.* 2013-1021, 1022, p. 12

to invoke methods and use defined objects, which are arranged in a particular structure, sequence, and organization. I understand that in the Google AdWords API agreement it exerts control over "the proprietary AdWords API and its specifications."¹⁵¹ The AdWords agreement defines the "AdWords APIs" as "a feature of the Google AdWords program and any account management using the AdWords API is also governed by the AdWords terms and conditions between you and Google."¹⁵² The agreement states that using the "AdWords API" means: "(A) the use of the mark-up language described in the AdWords API Specifications to (i) access Google servers through the AdWords API, (ii) send information to AdWords accounts using an AdWords API Client, or (iii) receive information from Google in response to AdWords API calls; and/or (B) distributing or developing an AdWords API Client."¹⁵³

209. Under this definition, then, API declarations stated in a specification document are subject to the agreement. "AdWords API Specifications" are defined as "all information and documentation Google provides specifying or concerning the AdWords API specifications and protocols and any Google-supplied implementations or methods of use of the AdWords API."¹⁵⁴

210. I reviewed the AdWords API specification as defined in the agreement and available on Google's website. I see that the API specification includes declarations written in a markup language and format called XML. As Google puts it: "The core messaging technology for the AdWords API is SOAP, which is an XML and HTTP-based protocol with wide support in the

¹⁵¹ "AdWords API Beta: Terms and Conditions," Google Developers, Jan. 25, 2005, <http://web.archive.org/web/20050130011554/http://www.google.com/apis/adwords/terms.html> (accessed Feb. 8, 2016) at Preamble; "AdWords API: Terms and Conditions," Google Developers, Feb. 22, 2013, <https://web.archive.org/web/20140704175508/https://developers.google.com/adwords/api/docs/terms> (accessed Feb. 8, 2016) (nearly identical terms); "Adwords API Terms and Conditions," Google Developers, Feb. 23, 2015, <https://web.archive.org/web/20150406213931/https://developers.google.com/adwords/api/docs/terms> (accessed Feb. 8, 2016) and <https://web.archive.org/web/20150922081038/https://support.google.com/adwordspolicy/answer/6169371> (accessed Feb. 8, 2016) (similar terms)

¹⁵² "AdWords API Beta: Terms and Conditions," Google Developers, Jan. 25, 2005, <http://web.archive.org/web/20050130011554/http://www.google.com/apis/adwords/terms.html> (accessed Feb. 8, 2016) at Preamble.

¹⁵³ "AdWords API Beta: Terms and Conditions," Google Developers, Jan. 25, 2005, <http://web.archive.org/web/20050130011554/http://www.google.com/apis/adwords/terms.html> (accessed Feb. 8, 2016) at I (Definitions)

¹⁵⁴ "AdWords API Beta: Terms and Conditions," Google Developers, Jan. 25, 2005, <http://web.archive.org/web/20050130011554/http://www.google.com/apis/adwords/terms.html> (accessed Feb. 8, 2016) at I (Definitions)

industry. The AdWords API uses document/literal style SOAP 1.1. To access AdWords accounts programmatically, you build web service clients that use the AdWords API. Typically your web service client program would use a toolkit that knows how to connect to and interact with web services."¹⁵⁵

211. The AdWords API declarations are lines of XML code that developers would type and invoke, to obtain access to Google's backend software implementations and data relating to Google's search services. For example, developers would build client programs in which they type the declaring code for Google AdWord services such as "Campaign Service," "AdGroup Service," "Keyword Service," "Creative Service," "Info Service," "TrafficEstimator Service" and "Report Service."¹⁵⁶ A developer would type the API declaring code in their client programs, in order to cause software implementations within Google's services to carry out desired functionality. Each of these services has API specification documentation laying out the lines of declaring code that can be used, and which developers become familiar with, just like the Java API specifications at issue in this case. For example, a developer could click on links for the

¹⁵⁵ "Developer's Guide – AdWords API," Jan 25, 2005, Google Developers, <http://web.archive.org/web/20050130052713/http://www.google.com/apis/adwords/developer/index.html> (accessed Feb. 8, 2016). Google provides such client toolkits, including Java toolkits that uses the AdWords APIs: "To use the AdWords API, write a client program in a language of your choice (such as Java, Perl, Python, C, C++, PHP). Write your client program to send a request to one of the AdWords Web Services, such as the TrafficEstimatorService or the AdGroupService. The relevant service will process the request and send back a response, which your client program needs to parse. Since the AdWords API runs as a web service, there is nothing that you need to install related to the AdWords API. The only software you need to install to use the AdWords API is the software for the language and toolkit that you will be using to write your client programs. For example, if you intend to write your client programs in Java, you will need to install Java and also a SOAP toolkit such as Axis.... The operations provided by a web service are defined in a WSDL (web services definition language) file which is posted on a website. To connect to a web service, you need to know the URL for the WSDL. For all the AdWords API services, the URL for the WSDL has the following form: <https://adwords.google.com/api/adwords/v2/ServiceNameService?wsdl> The exact details of how the client program connects to the WSDL depends on the language and the toolkit being used. Typically, the toolkit has a function for connecting to a service. You simply call the relevant function and pass in the URL for the WSDL." "Developer's Guide – AdWords API," Google Developers, <http://web.archive.org/web/20050130041006/http://www.google.com/apis/adwords/developer/AdGroupService.html> (accessed Feb. 8, 2016)

¹⁵⁶ "Developer's Guide – AdWords API," Google Developers, http://web.archive.org/web/20050130050023/http://www.google.com/apis/adwords/developer/adwords_api_services.html (accessed Feb. 8, 2016)

specification “Reference pages” for each of these services, where they can learn and understand the declaring code for the AdWords API, as seen in Figure 18:¹⁵⁷


Figure 19: Reference Page Links for the AdWords API

Manage data in your AdWords accounts	
Campaign Service Overview Reference pages WSDL	Keyword Service Overview Reference pages WSDL
AdGroup Service Overview Reference pages WSDL	Creative Service Overview Reference pages WSDL
Other services	
Info Service Overview Reference pages WSDL	TrafficEstimator Service Overview Reference pages WSDL
	Report Service Overview Reference pages WSDL

212. Once a developer visited the API specification at the “Reference pages,” they would see a list of short lines of declaring code and descriptions of the functions that the declaring code carries out. For example, if they visited the API specification for “AdGroup Service”, as is shown in Figure 19 below, they would see the specification document listing declaring code for specific functions such as “addAdGroup,” “addAdGroupList,” “getAdGroup,” “getAdGroupList,” “getAdGroupStats,” “getAllAdGroups,” “updateAdGroup,” and “updateAdGroupList.”¹⁵⁸

¹⁵⁷ “Developer’s Guide – AdWords API,” Google Developers, http://web.archive.org/web/20050130050023/http://www.google.com/apis/adwords/developer/adwords_api_services.html (accessed Feb. 8, 2016)

¹⁵⁸ “Developer’s Guide – AdWords API,” Google Developers, <http://web.archive.org/web/20050130041006/http://www.google.com/apis/adwords/developer/AdGroupService.html> (accessed Feb. 8, 2016)

Figure 20: API Specification for AdGroupService


Developer's Guide - AdWords API

[Introduction](#)
[AdWords API Web Services](#)
[Reference](#)

[CreativeService](#)
[Creative](#)

[KeywordService](#)
[Keyword](#)

[AdGroupService](#)
[AdGroup](#)

[CampaignService](#)
[Campaign](#)
[LanguageTarget](#)
[GeoTarget](#)

[TrafficEstimatorService](#)
[KeywordRequest](#)
[KeywordEstimate](#)
[AdGroupRequest](#)
[AdGroupEstimate](#)
[CampaignRequest](#)
[CampaignEstimate](#)

[ReportService](#)
[KeywordReportJob](#)
[AdTextReportJob](#)
[UrlReportJob](#)
[CustomReportJob](#)

[InfoService](#)

General Data Types
[StatsRecord](#)

[Error Codes](#)
[Language and Geotargeting Codes](#)

Other Resources
[AdWords API Home](#)
[Sample Code](#)
[FAQ](#)

AdGroupService

AdGroupService provides operations for accessing, modifying, and creating AdGroups.

The WSDL for this service is at <https://adwords.google.com/api/adwords/v2/AdGroupService?wsdl>

Requests

- [addAdGroup](#)
- [addAdGroupList](#)
- [getAdGroup](#)
- [getAdGroupList](#)
- [getAdGroupStats](#)
- [getAllAdGroups](#)
- [updateAdGroup](#)
- [updateAdGroupList](#)

addAdGroup

Create a new AdGroup.

Parameters

campaignID	int	The campaign in which this AdGroup will be created.
newData	AdGroup	the new parameters for the AdGroup. <ul style="list-style-type: none"> If 'status' is not present, 'Enabled' is used. See AdGroup.status for more details. If 'name' is not present, a default value of the form "Ad Group #N" will be used. See AdGroup.name for more details. 'maxCpc' must be present. See AdGroup.maxCpc for more details. The 'id' field will be ignored; the ID is set by the AdGroupService.

Response

[AdGroup](#)

the new AdGroup with all values (including IDs) filled in.

addAdGroupList

Create multiple new AdGroups. All the AdGroups must be associated with the same Campaign.

Parameters

campaignID	int	The campaign associated with all the new AdGroups
newData	AdGroup []	The new parameters for the AdGroup. See addAdGroup for details.

Response

[AdGroup](#) []

the List of new AdGroups, with all values (including IDs) filled in.

getAdGroup

Load all information about the specified AdGroup

Parameters

adGroupId	int	The ID of the specified AdGroup
------------------	-----	---------------------------------

Response

[AdGroup](#)

a structure with the adgroup data

213. As can be seen, these declarations are short lines of code that developers type and use to invoke AdWords software implementations, similar to the lines of declaring code at issue. As Google puts it, “reference pages for the services list the requests that the service handles. Requests take input parameters and return a response. Both the input parameters and the response might be a simple type (such as a long) or a data object, such as a Campaign.”¹⁵⁹

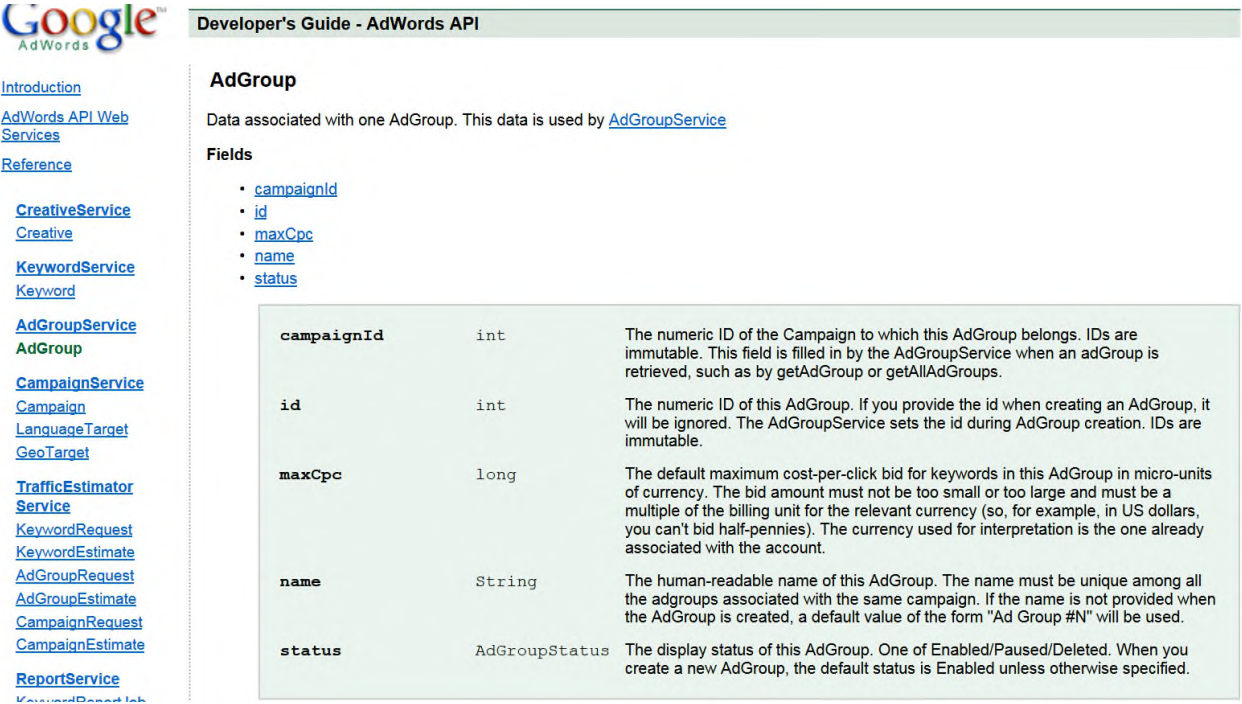
214. In these API specification pages, if a developer navigates to the page for a particular method, for example if the user clicks on “addAdGroup,” they would get taken to a page that further lists “field” declarations associated with “addAdGroup,” which developers would use to invoke the methods for “addAdGroup.” As Google describes this: “reference pages for the data objects list the fields on the object. How you construct request and input parameters depends on the toolkit and language you are using, or whether you are coding directly in XML.”¹⁶⁰ An example follows in Figure 20.

¹⁵⁹ “Developer’s Guide – AdWords API,” Google Developers, http://web.archive.org/web/20050130024343/http://www.google.com/apis/adwords/developer/adwords_api_classref.html (accessed Feb. 8, 2016)

¹⁶⁰ “Developer’s Guide – AdWords API,” Google Developers, http://web.archive.org/web/20050130024343/http://www.google.com/apis/adwords/developer/adwords_api_classref.html (accessed Feb. 8, 2016)

Figure 21: List of Fields required by AdGroup to Pass to addAdGroup

215.



Google
AdWords

Developer's Guide - AdWords API

[Introduction](#)
[AdWords API Web Services](#)
[Reference](#)
[CreativeService](#)
[Creative](#)
[KeywordService](#)
[Keyword](#)
[AdGroupService](#)
[AdGroup](#)
[CampaignService](#)
[Campaign](#)
[LanguageTarget](#)
[GeoTarget](#)
[TrafficEstimatorService](#)
[KeywordRequest](#)
[KeywordEstimate](#)
[AdGroupRequest](#)
[AdGroupEstimate](#)
[CampaignRequest](#)
[CampaignEstimate](#)
[ReportService](#)
[KeywordDemand](#)

AdGroup

Data associated with one AdGroup. This data is used by [AdGroupService](#)

Fields

- [campaignId](#)
- [id](#)
- [maxCpc](#)
- [name](#)
- [status](#)

campaignId	int	The numeric ID of the Campaign to which this AdGroup belongs. IDs are immutable. This field is filled in by the AdGroupService when an AdGroup is retrieved, such as by getAdGroup or getAllAdGroups .
id	int	The numeric ID of this AdGroup. If you provide the id when creating an AdGroup, it will be ignored. The AdGroupService sets the id during AdGroup creation. IDs are immutable.
maxCpc	long	The default maximum cost-per-click bid for keywords in this AdGroup in micro-units of currency. The bid amount must not be too small or too large and must be a multiple of the billing unit for the relevant currency (so, for example, in US dollars, you can't bid half-pennies). The currency used for interpretation is the one already associated with the account.
name	String	The human-readable name of this AdGroup. The name must be unique among all the adgroups associated with the same campaign. If the name is not provided when the AdGroup is created, a default value of the form "Ad Group #N" will be used.
status	AdGroupStatus	The display status of this AdGroup. One of Enabled/Paused/Deleted. When you create a new AdGroup, the default status is Enabled unless otherwise specified.

216. Thus, it can be seen that the AdWords APIs consist of brief lines of declaring code to invoke methods and use defined objects, which are arranged in a particular structure, sequence, and organization. As Google makes clear in its terms and conditions, these APIs are subject to Google's control in the form of a license, just as Oracle licenses the Java platform that contains the 37 Java API packages.

K. The 37 Java API Packages Are Not the Same as the Java Programming Language

217. Dr. Astrachan states that Google had to copy declaring code so developers would recognize Android as a platform implementing the Java programming language. (Astrachan ¶171) First, he attempts to conflate the Java language and the APIs, by saying that APIs are key to the function and use of the Java language. Second, he suggests the 37 Java API packages are essential to the language. I disagree with both contentions.

218. The 37 Java API packages are not key to the function and use of the language. The Java Language Specification, in the course of providing "a complete specification of the syntax and semantics of the language", does not require all 37 Java API packages at issue here, let alone all 166 packages from the Java SE 5.0 platform.